Work Order ID 86655

July-06-12 11:13:10 AM

86655

Item ID: D3304-044 **Accept** *N900040100* **Setup Start** *NS1*

Revision ID: **Stop** *NS2*

Item Name: Tube Assembly

Start Date: 7/06/12 **Start Qty:** 6.00 *6*

Required Date: 8/03/12 **Req'd Qty:** 6.00 *6*

Reference:

Cust Item ID:

Customer:

Approvals: **Process Plan:** ✓ **Date:** 12-07-17 **Tooling:** _____ **Date:** _____

QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	**Revision Nbr**								
D3304	Rev B								
100		0.00							
100	BAND SAW								
Bandsaw	**Memo**	0.00			RO 12-07-17	6			
Jeaspa Bandsaw	1- Cut blank: 22.00" as per Dwg D3304								
110		0.00							
110	CONVENTIONAL LATHE								
Lathe Conv	**Memo**	0.00			RO 12-07-17	6			
Conventional Lathe	1- Cut blank: 22.00" as per Dwg D33042- Turn as per Dwg D33043- Deburr								
120	QC2- Inspect parts off machine FAI/FAIB	0.00							
120					RO 12-09-17	6			
QC	**Memo**	0.00							
Quality Control									

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Item ID: D3304-044 **Accept** *N900040100* **Setup Start** *NS1*
Revision ID: **Stop** *NS2*
Item Name: Tube Assembly

Start Date: 7/06/12 **Start Qty:** 6.00 *6* **Cust Item ID:**
Required Date: 8/03/12 **Req'd Qty:** 6.00 *6* **Customer:**
Reference:

Run Start *NR1*
Stop *NR2*

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	QC8- Inspect parts - second check	0.00				6			
130									
QC	**Memo**	0.00 DAS 9-6-13	12217						
Quality Control									
140		0.00							
140	Small Fab					5	1		12-09-11
Small Fab	**Memo**	0.00							
Small Fab	1- Drill as per Dwg D3304 using drill Jig D3304-T12- Form as per Dwg D33043- Cut tube to length as per Dwg D33044-Check with DT8657 JIG4- Deburr								
150	QC5- Inspect part completeness to step on W/O	0.00 SMB 12-9-12	DAS 16 6-5-12	17dk12		5			
150									
QC	**Memo**	0.00							
Quality Control									

PTO

Dart Aerospace Ltd

W/O: 86653	WORK ORDER CHANGES						
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: D3304-044 **PAR #:** _____ **Fault Category:** Small Part **NCR:** (Yes) No **DQA:** [illegible] **Date:** 12/10/11

Resolution: Scrap **Disposition:** Scrap **QA: N/C Closed:** [illegible] **Date:** 12/10/11

NCR: 12-1877

WORK ORDER NON-CONFORMANCE (NCR)

DATE	STEP	Description of NC Section A	Corrective Action Section B: Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
12-09-11	140	1 piece was snap hole didn't align ~~R.C. Process~~	DAS 16 9 QS2042 12/9/12	Scrap + history No replace	~~FF~~ 12-09-11	SS 12/09/11	DAS 16 9 QS2042 12/9/12	DAS 16 12/09/12
		R.C. inadequate tooling to Do the Job		# 197.01				

NOTE: Date & initial all entries

Work Order ID 86655

July-06-12 11:13:10 AM

86655

Item ID: D3304-044 **Accept** *N900040100* **Setup Start** *NS1*
Revision ID: **Stop** *NS2*
Item Name: Tube Assembly

Start Date: 7/06/12 **Start Qty:** 6.00 *6*
Required Date: 8/03/12 **Req'd Qty:** 6.00 *6*
Reference:

Cust Item ID:
Customer:

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Run Start *NR1*
Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160		0.00							
160	Large Fab					5			12-09-26 JSL
Large Fab	**Memo**	0.00							
Large Fab	Weld bracket as per Dwg D3304 and QSI 004 M122357								
170	QC9- Inspect visual per QSI004- Fusion Welds	0.00							
170						5	12-09-26		DAS 09 12-09
QC	**Memo**	0.00							
Quality Control									
180	QC5- Inspect part completeness to step on W/O	0.00 SMB 12-9-26				5			
180									
QC	**Memo**	0.00 DAS 16 12/01/26							
Quality Control									

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Item ID: D3304-044 **Accept** *N900040100* **Setup Start** *NS1*
Revision ID: **Stop** *NS2*
Item Name: Tube Assembly

Start Date: 7/06/12 **Start Qty:** 6.00 *6* **Cust Item ID:**
Required Date: 8/03/12 **Req'd Qty:** 6.00 *6* **Customer:**
Reference:

Run Start *NR1*
Stop *NR2*

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
190	Grey Sandtex(Ref:4.3.5.6) per QSI005 4.3	0.00				5			MF 12/04/26
190 Powdercoat	**Memo** 1:50	0.00							
Powder Coating	START TIME: _____ OVEN TEMPERATURE:								
M121279	2:20 FINISH TIME: 320°F								
200	QC3- Inspect Part Finish	0.00				5			12-04-26
200 QC	**Memo**	0.00							
Quality Control									
210		0.00				5			FF 12-09-27
210 Small Fab	Small Fab								
Small Fab	**Memo**	0.00							
Small Fab	Assemble lanyard and pip pin as per Dwg D3304Identify as D3304-044								

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Item ID: D3304-044 **Accept** *N900040100* **Setup Start** *NS1*
Revision ID: **Stop** *NS2*
Item Name: Tube Assembly

Start Date: 7/06/12 **Start Qty:** 6.00 *6* **Cust Item ID:**
Required Date: 8/03/12 **Req'd Qty:** 6.00 *6* **Customer:**
Reference:

Run Start *NR1*
Stop *NR2*

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____
QC: _____ **Date:** _____ **SPC (Y/N):** _____ **Date:** _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220	QC5- Inspect part completeness to step on W/O	0.00 SmB 12-27	DAS 16 2-53			5			
220 QC Quality Control	**Memo**	0.00	12/07/27						
230	Identify as per dwg & Stock Location: ST/86	0.00							
230 Packaging Packaging	**Memo**	0.00				5			12/09/28 JB
240	QC21- Final Inspection - Work Order Release	0.00							
240 QC Quality Control	**Memo**	0.00				12/10/12			

MF 12-10-12

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

July-06-12 11:13:09 AM

Work Order ID: 86655

Parent Item: D3304-044 **Start Date:** 7/06/12 **Required Date:** 8/03/12

Parent Item Name: Tube Assembly **Start Qty:** 6.00 **Required Qty:** 6.00

Comments: IPP: D 04.11.26 Revised Steps 7 KJ/JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
BLBS-0016 PIP PIN		Purchased	No			210	Each	19.0000	1	6	(5)	FF 12-09-27	
				Location		**Loc Qty**		**Loc Code**					
				ST283		9							
					113565	9							
				ST284		10							
					122190	10				5			
CBL-1240 Cable		Purchased	No			100	f	776.2792	1.0416	6.2496	(5)	FF 12-09-27	
				Location		**Loc Qty**		**Loc Code**					
				GA		776.279191							
					113565	3.911789							
					119021	259.334002				5,208			
					119690	13.0334							
					122190	500							
CBL-460 Loop Sleeve		Purchased	No			210	Each	578.0000	2	12	(5)	FF 12-09-27	
				Location		**Loc Qty**		**Loc Code**					
				GA		578							
					121574	578				10			
D3304-8 Bracket		Manufactured	No			210	Each	2.0000	1	6			12-09-28 JSC
				Location		**Loc Qty**		**Loc Code**					
				WA022		2							
					44399	2				2			
				86921						3			

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Picklist Print

July-06-12 11:13:09 AM

Work Order ID: **86655**

Parent Item: **D3304-044**

Parent Item Name: Tube Assembly

Start Date: 7/06/12 **Required Date:** 8/03/12

Start Qty: 6.00 **Required Qty:** 6.00

M304TR0.875W.065	Purchased	No		160	f	47.0000	**1.8542**	**11.710737**

304 round tube .875 x .065w

Location	Loc Qty	Loc Code
MAT017	47	
110680	7	
121317	40	

12. 12-07-17

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

D3304-041 TUBE ASSEMBLY

D3304-044 TUBE ASSEMBLY (SHOWN)
D3304-043 OPPOSITE

D3304-041/-043/-044 NOTES:

1) FINISH: POWDER COAT GREY SANDTEX (REF. 4.3.5.6) PER DART QSI 005 4.3
2) WELD PER DART QSI 004
3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
4) ALL DIMENSIONS ARE IN INCHES
5) BREAK ALL SHARP EDGES 0.005 TO 0.015
6) IDENTIFY AS INDICATED USING FINE POINT PERMANENT INK MARKER "TCCA-PDA, DART AEROSPACE LTD, P/N D3304-XXX B/N BXXXXX, FOR PRODUCT ELIGIBILITY SEE PDA04-11"
7) IF BEING ASSEMBLED WITH D3303-041, ADD THE FOLLOWING USING A FINE POINT PERMANENT INK MARKER: "TCCA-PDA, DART AEROSPACE LTD, P/N D412-724-XXX B/N BXXXXX, FOR PRODUCT ELIGIBILITY SEE PDA04-11"

RELEASED 05.08.11

REV	DATE	DESCRIPTION
A	04.08.18	NEW ISSUE
B	05.07.15	UPDATE DIMENSIONS; ADD D3304-7/-8

DART

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DESIGN	DRAWN BY	DRAWING NO.	REV.
RF	RF	D3304	B

CHECKED	APPROVED	SHEET
		1 OF 4

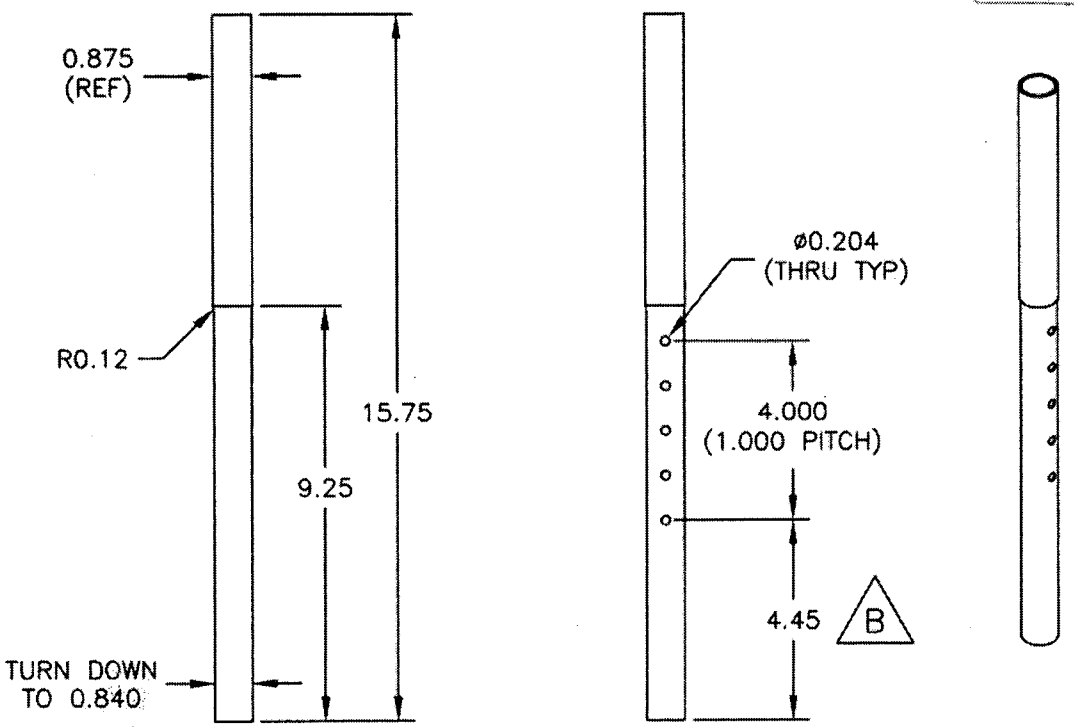
DATE: 05.07.15

TITLE: TUBE ASSEMBLY

SCALE: 1:6

DESIGN	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
RF	RF		
CHECKED	APPROVED	DRAWING NO.	REV. B
		D3304	SHEET 2 OF 4
DATE		TITLE	SCALE
05.07.15		TUBE ASSEMBLY	1:4

RELEASED
05.08.11

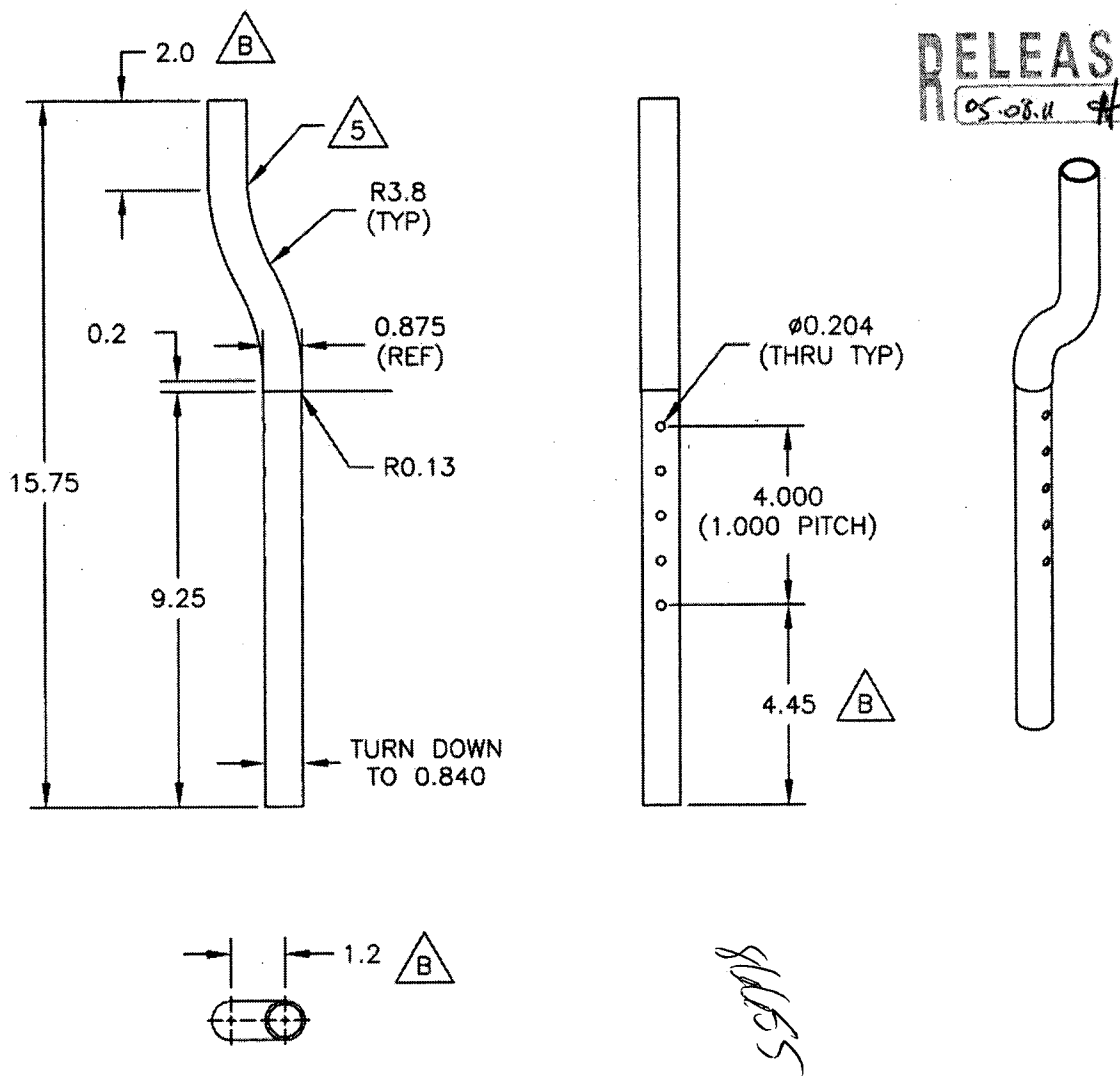


D3304-1 TUBE

D3304-1 NOTES:
1) MATERIAL: AISI 304/316 STAINLESS STEEL TUBE ø0.875 x 0.065 WALL
(REF. DART SPEC M304TR0.875W.065) ENSURE SEAMLESS TUBE IS USED
2) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
3) ALL DIMENSIONS ARE IN INCHES
4) BREAK ALL SHARP EDGES 0.005 TO 0.015

DESIGN	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
RF	RF		
CHECKED	APPROVED	DRAWING NO.	REV. B
		D3304	SHEET 3 OF 4
DATE		TITLE	SCALE
05.07.15		TUBE ASSEMBLY	1:4

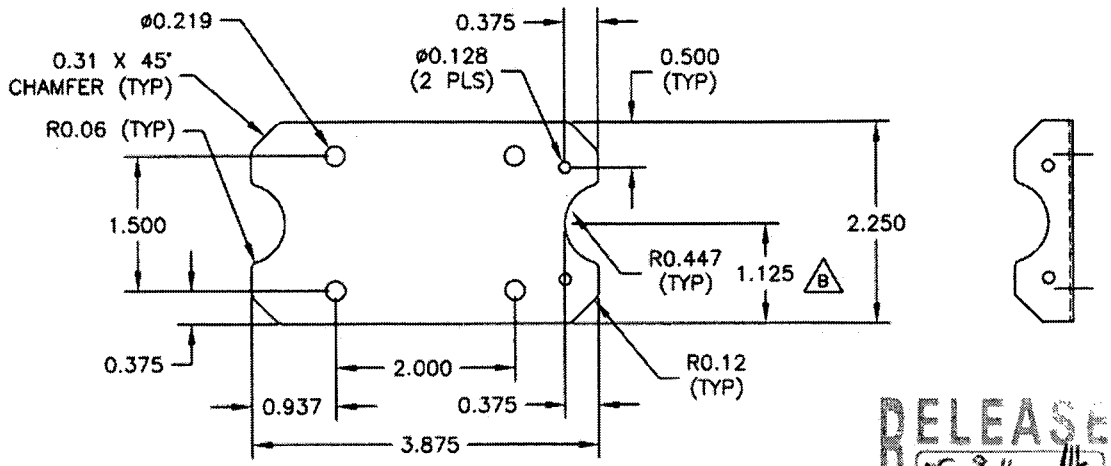
RELEASED
05.08.11



D3304-3 TUBE

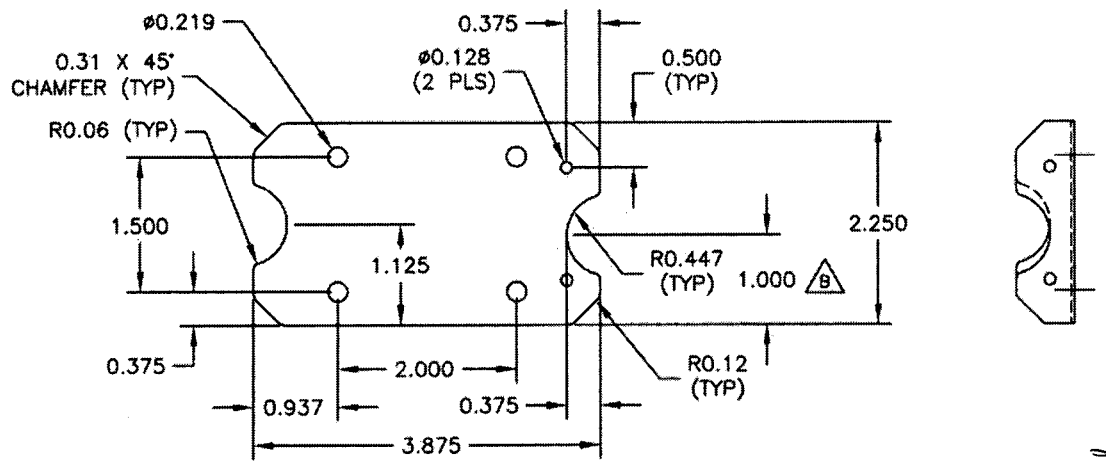
D3304-3 NOTES:
1) MATERIAL: AISI 304/316 STAINLESS STEEL TUBE ø0.875 x 0.065 WALL
(REF. DART SPEC M304TR0.875W.065) ENSURE SEAMLESS TUBE IS USED
2) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
3) ALL DIMENSIONS ARE IN INCHES
4) BREAK ALL SHARP EDGES 0.005 TO 0.015
5) BEND LINES 9.625, 13.375 DIMENSIONS

DESIGN	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
RF	RF		
CHECKED	APPROVED	DRAWING NO.	REV. B
		D3304	SHEET 4 OF 4
DATE		TITLE	SCALE
05.07.15		TUBE ASSEMBLY	1:2

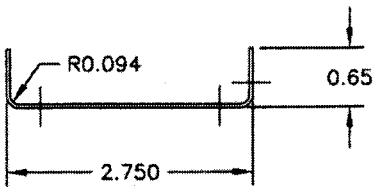


RELEASED
05.08-11

D3304-5 FLAT PATTERN



D3304-7/-8 FLAT PATTERN



D3304-5/-7 BRACKET
D3304-8 OPPOSITE B

NOTES:
1) MATERIAL: AISI 304/316 SS 0.040 THICK SHEET (REF. DART SPEC M304S20GA)
2) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
3) ALL DIMENSIONS ARE IN INCHES
4) BREAK ALL SHARP EDGES 0.005 TO 0.015

DART AEROSPACE LTD	Work Order:	26655
Description: Tube Assembly	Part Number:	D3304-3
Inspection Dwg: D3304 **Rev:** B		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

[X] First Article [ ] Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
9.25	+/-0.030	9.26	—		RA 096	✓ sm
Ø0.840	+/-0.010	.845	—		" 026	
Ø0.875	+/-0.010	.877			"	
0.065	+/-0.010	.067	—		RA 76	✓ sm

Measured by:		Audited by:		Prototype Approval:	N/A
Date:	12-07-17	Date:	12/7/17	Date:	N/A

Rev	Date	Change	Revised by	Approved
A	04.09.08	New Issue P/O D3304-043/-044	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: Date:

Work Order: _____

Part No. _____

NCR No. _____

DISPOSITION

- Rework ☐
- Scrap ☐
- Use-as-is ☐
- Work Order Update ☐

AGAINST DEPARTMENT/PROCESS

- Skid-tube ☐
- Machining ☐
- Thermoforming ☐
- Large Fab ☐
- Crosstube ☐
- Small Fab ☐
- Finishing ☐
- Composite ☐
- Water Jet ☐
- Prod. Eng. Coor. ☐
- Rec/Store/Packaging ☐
- Supplier ☐
- Engineering ☐
- Quality ☐
- Other ☐

Root Cause		Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data	☐									
Equip/Tooling	☐									
Operator	☐									
Material	☐									
Setup	☐									
Other	☐									
Process	☐									
Supplier	☐									
Training	☐									
Unapproved	☐									

FAULT CATEGORY

Landing Gear

- ☐ Bending
- ☐ Centre Not Concentric to O/S
- ☐ Cracks
- ☐ Crushed/Crimped
- ☐ Cuffs
- ☐ Heat Treat
- ☐ Inspection Strip in Tube
- ☐ Ripples in Bend
- ☐ Torque Waves in Extrusion
- ☐ Turning Sequence
- ☐ Wave/Twist in Tube

General

- ☐ Bend
- ☐ BOM/Route
- ☐ Broken/Damaged
- ☐ Burrs
- ☐ Contamination
- ☐ Countersink
- ☐ Cut Too Short
- ☐ Drill Holes
- ☐ Drawing
- ☐ Finish
- ☐ Folio
- ☐ Grain
- ☐ Hardware
- ☐ Inspection Incomplete
- ☐ Instructions Incomplete/Unclear
- ☐ Maintenance
- ☐ Mislabeled
- ☐ Misread
- ☐ Offset
- ☐ Out of Calibration
- ☐ Out of Sequence
- ☐ Outside Dimensions
- ☐ Ovalized
- ☐ Over/Under tolerance
- ☐ Part Incorrect
- ☐ Part Lost/Missing
- ☐ Part Moved
- ☐ Positioned Wrong
- ☐ Power Loss/Surge
- ☐ Pressure/Forced
- ☐ Temperature/Cure
- ☐ Weld
- ☐ Wrong Stock Pulled
- ☐ Other

_____

_____

_____